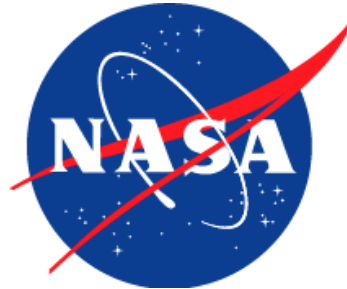

Measurement Protocol

for use of handheld, direct solar, sun photometers



SIMBIOS Project, Code 970.2
NASA Goddard Space Flight Center
Greenbelt, MD 20770, USA

SIMBIOS.GSFC.NASA.GOV

Documentation for:

Microtops II (Solar Light Company, USA)

SIMBAD (Laboratoire d'Optique Atmosphérique, France)

SIMBADA (Laboratoire d'Optique Atmosphérique, France)

The purpose of this document is to provide information and instructions needed to capture high quality data with any SIMBIOS sun photometer. For further guidance, please write to sunphoto@simbios.gsfc.nasa.gov, or call +1 (301) 286-7109.

Last edited: October 13, 2003

Table of Contents

Microtops II Sun Photometer	3
Contents	3
Setup	5
Operation	7
Downloading Data	9
SIMBAD Handheld Above Water Radiometer and Sun Photometer	14
Contents	14
Setup	14
Operation	14
Downloading Data	16
SIMBADA Above Water Radiometer And Sun Photometer	19
Contents	19
Setup	19
Operation	19
Downloading Data	21

Microtops II Sun Photometer

Contents

The Microtops II instrument is shipped with the following items (clockwise from top-left in Figure 1):

1. Microtops II case
2. Microtops II serial cable
3. Microtops II instrument
4. SIMBIOS Measurement Protocol (this document)
5. Microtops II instruction manual
6. Garmin GPS instruction manual
7. Garmin GPS case
8. Garmin GPS 38 unit
9. Garmin GPS connector cable
10. Spare AA batteries (four each for Microtops II and Garmin GPS).

Figure 1: Microtops II equipment



Figure 2: The Microtops II



Figure 3: The Garmin GPS 38



Setup

Hardware

1. Check that the batteries for the Microtops II and Garmin GPS are loaded properly and functioning.
2. Clean the optics window of the Microtops II with non-abrasive paper or wipes. Use an alcohol (or other optics safe) cleaning solution. Do not put the cleaning solution directly on the optics. If the instrument is deployed at sea, be sure to clean the it at the start of each day.

Figure 4: Materials needed for cleaning



GPS

1. Turn on the Garmin GPS 38 by pushing and holding the red 'on' button.
2. The unit will begin searching for satellites. When three satellites are found (indicated by three solid bars at the bottom of the LCD display), the unit can begin communicating with the Microtops II unit.
3. To reduce the amount of satellite search time, the geographical location can be entered into the unit prior to use. To do this, press the [ENTER] button. A menu will appear on the LCD display. Select the first option "SELECT COUNTRY FROM

LIST,” by pressing the [ENTER] key again. A list of countries will appear. Use the arrow keys to select a country, then press [ENTER] again to confirm the choice. Effective search time can also be reduced by turning the GPS unit on an hour or so prior to the first Microtops II deployment. Subsequent operation during field deployment should require much less search time.

4. Check that the GPS interface is configured to communicate with the Microtops II. Press the [PAGE] button until you reach the main menu. Scroll up and down until the “INTERFACE” option is selected, and press [ENTER]. The interface should be set to “NONE/NMEA - NMEA 0183 2.0 - 4800 baud” (or any NONE/NMEA configuration at 4800 baud). If it is not, use the arrow keys and [ENTER] to scroll through the configuration options until you find the appropriate setting.

For more information, please refer to: “Owner’s Manual & Reference: Garmin GPS 38.”

Microtops II

1. Turn on the Microtops II by pressing the ON/OFF button. The instrument will beep, and begin making dark current measurements (keep the instrument in the shade during this process). The LCD display will show “hardware test...” and will list the software version number. After the dark current measurements have finished, the LCD panel will display “RDY” followed by the instrument ID number, the location of measurements, the time, and the date.
2. If you do not intend to use the Garmin GPS, the location, date and GMT time *must be entered* into the instrument. This is done as follows
 - a. To select instrument location:
 - i. Press the [MENU/ENTER] key to enter the menu mode. The LCD will display “Main menu Clock”.
 - ii. Press the [Decr] button twice, until “Location” is shown on the LCD.
 - iii. Press the [MENU/ENTER] key. The LCD will display “Location Saved Location”
 - iv. The current location can be entered by either selecting a saved location or entering coordinates. Press the [MENU/ENTER] key to select options, and the [SCAN/ESCAPE] key to exit a menu level.
 - b. To set date and time:
 - i. Press the [MENU/ENTER] key enter the menu mode. The LCD will display “Main menu Clock”.
 - ii. Press the [MENU/ENTER] key again. The LCD will display the “Adjust Clock” option.
 - iii. Press the [MENU/ENTER] key again, then enter the current GMT and date using the arrow keys. Press [SCAN/ESCAPE] when done.
3. Date, time and location can be set automatically when using the Microtops II with the Garmin GPS connected. To ensure a proper connection, the communication baud rate must be set to 4800 bits/sec. This is done as follows:
 - a. Press the [MENU/ENTER] key enter the menu mode. The LCD will display “Main menu Clock”.
 - b. Press the [Decr] button four times, until “Baud rate” is shown on the LCD. Press the [MENU/ENTER] key.

- c. Use the arrow keys to select a baud rate of 4800. Press [Menu/Enter] to select, then [SCAN/ESCAPE] to exit the menu.
- d. Next, plug the Microtops II into the Garmin GPS as shown in Figure 5, and turn both instruments on. The GPS may take several minutes to acquire its location (see above). When this happens, the Microtops II will beep, and continue to do so as coordinates are updated. You may disconnect the GPS if your location will not change for that set of measurements (if, for example, you are at a ship cruise station).

Figure 5: A Microtops II connected to a Garmin GPS 38



For more information, please refer to: “User’s Guide: Microtops II Ozone Monitor & Sunphotometer.”

Operation

1. The Microtops II is intended for use in cloud free conditions. Before deployment, please be sure there are no thin cirrus (or any other type) clouds in front of the sun.
2. Open the optics cover completely.

3. Using the “Sun Target,” aim the instrument at the sun. If needed, brace your arms to hold the instrument as steady as possible. See Figure 6.
4. With the sun in the center of the “Sun Target,” press the [SCAN/ESCAPE] button to make a measurement. The current instrument protocol makes twenty measurements (in about six seconds) and saves the highest voltage value. This is intended to keep data best aimed at the sun.
5. Make fourteen more measurements immediately. This is essential so that a post processing algorithm can remove data not pointed properly at the sun.
6. Turn off the instrument using the [ON/OFF] button.
7. Be sure to turn the instrument off and on between each set of fifteen measurements. This helps account for temperature changes, as the dark current value is taken each time the Microtops II is turned on.
8. On a research cruise, please be sure to make measurements at each station and within a half hour of each ocean color satellite overpass. If time permits, make measurements at other times (ie when the ship is moving) every hour or so. When the sun is low on the horizon, try to make more frequent measurements.

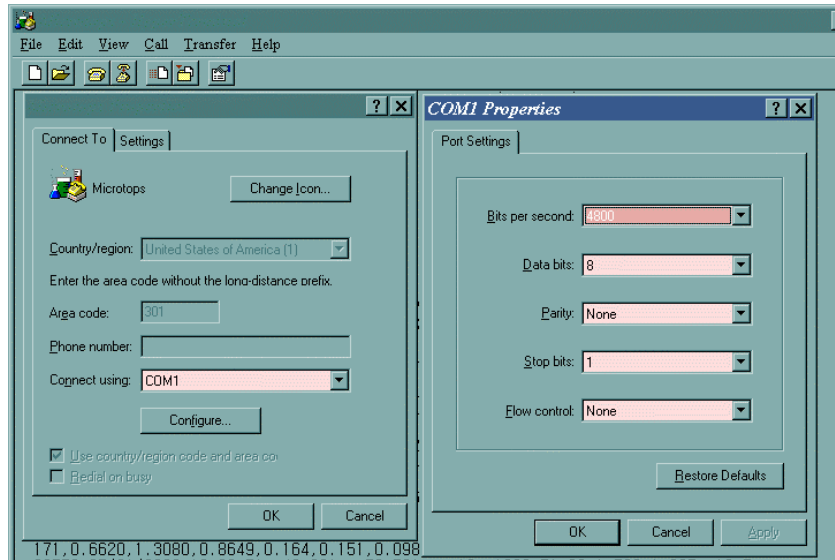
Figure 6: The Microtops II aimed at the sun



Downloading Data

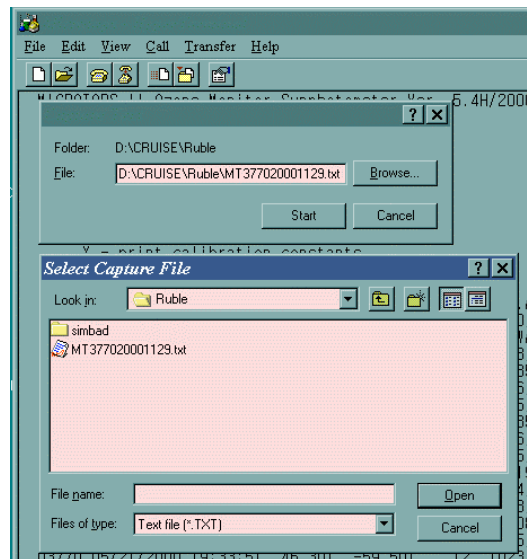
1. Using the serial cable provided with the Microtops II, connect the instrument to a PC.
2. Open the Hyperterminal software included with the PC. This software should be standard to all versions of Windows. If not, install from attached CD.
3. Turn on the Microtops II.
4. Check that the Microtops baud rate (set to 4800 bits/sec for communication with the GPS) matches the baud rate set in Hyperterminal. This is typically found in the pull down menus [FILE], [PROPERTIES], then [CONFIGURE].

Figure 7: Hyperterminal



5. Open a file with Hyperterminal by using the menus [TRANSFER] and [CAPTURE TEXT]. The file naming protocol is MT[serial#][year][month][day].txt. For example, the filename MT377020011112.txt would be a file from instrument #3770, downloaded on November 12th, 2001.

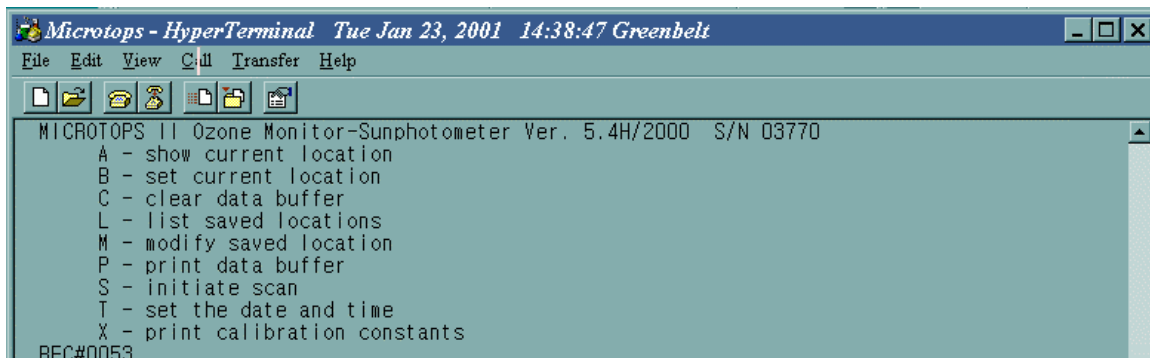
Figure 8: Hyperterminal file selection



6. Push the [RETURN] key to display the remote control keys with the Microtops II. These keys are:
A – show current location;

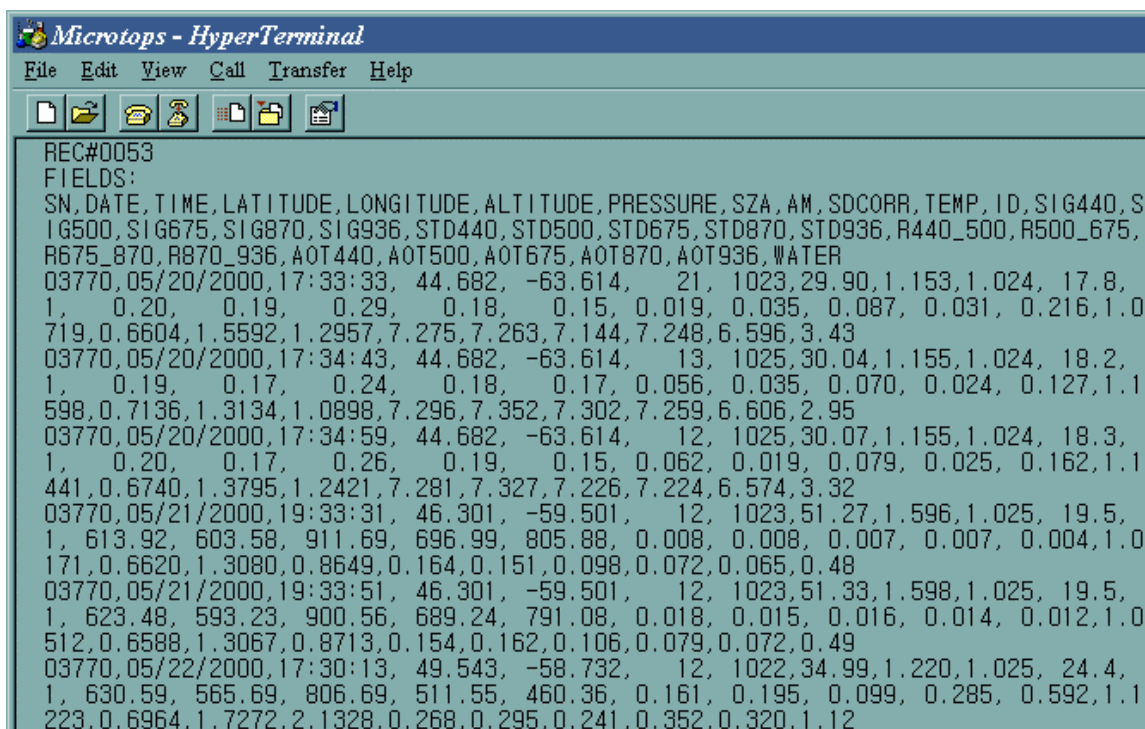
B – set current location;
C – clear data buffer;
L – list saved locations;
M – modify saved location;
P – print data buffer;
S – initiate scan;
T – set the date and time; and
X – print calibration constants.

Figure 9: Microtops controls in Hyperterminal



7. Press the [P] key to print the instrument data buffer.
8. Press the [X] key to print the current calibration constants.
9. Press the [C] key to clear the data buffer.

Figure 10: Microtops II data in Hyperterminal



```

Microtops - HyperTerminal
File Edit View Call Transfer Help

REC#0053
FIELDS:
SN, DATE, TIME, LATITUDE, LONGITUDE, ALTITUDE, PRESSURE, SZA, AM, SDCORR, TEMP, ID, SIG440, S
IG500, SIG675, SIG870, SIG936, STD440, STD500, STD675, STD870, STD936, R440_500, R500_675,
R675_870, R870_936, AOT440, AOT500, AOT675, AOT870, AOT936, WATER
03770, 05/20/2000, 17:33:33, 44.682, -63.614, 21, 1023.29.90, 1.153, 1.024, 17.8,
1, 0.20, 0.19, 0.29, 0.18, 0.15, 0.019, 0.035, 0.087, 0.031, 0.216, 1.0
719, 0.6604, 1.5592, 1.2957, 7.275, 7.263, 7.144, 7.248, 6.596, 3.43
03770, 05/20/2000, 17:34:43, 44.682, -63.614, 13, 1025.30.04, 1.155, 1.024, 18.2,
1, 0.19, 0.17, 0.24, 0.18, 0.17, 0.056, 0.035, 0.070, 0.024, 0.127, 1.1
598, 0.7136, 1.3134, 1.0898, 7.296, 7.352, 7.302, 7.259, 6.606, 2.95
03770, 05/20/2000, 17:34:59, 44.682, -63.614, 12, 1025.30.07, 1.155, 1.024, 18.3,
1, 0.20, 0.17, 0.26, 0.19, 0.15, 0.062, 0.019, 0.079, 0.025, 0.162, 1.1
441, 0.6740, 1.3795, 1.2421, 7.281, 7.327, 7.226, 7.224, 6.574, 3.32
03770, 05/21/2000, 19:33:31, 46.301, -59.501, 12, 1023.51.27, 1.596, 1.025, 19.5,
1, 613.92, 603.58, 911.69, 696.99, 805.88, 0.008, 0.008, 0.007, 0.007, 0.004, 1.0
171, 0.6620, 1.3080, 0.8649, 0.164, 0.151, 0.098, 0.072, 0.065, 0.48
03770, 05/21/2000, 19:33:51, 46.301, -59.501, 12, 1023.51.33, 1.598, 1.025, 19.5,
1, 623.48, 593.23, 900.56, 689.24, 791.08, 0.018, 0.015, 0.016, 0.014, 0.012, 1.0
512, 0.6588, 1.3067, 0.8713, 0.154, 0.162, 0.106, 0.079, 0.072, 0.49
03770, 05/22/2000, 17:30:13, 49.543, -58.732, 12, 1022.34.99, 1.220, 1.025, 24.4,
1, 630.59, 565.69, 806.69, 511.55, 460.36, 0.161, 0.195, 0.099, 0.285, 0.592, 1.1
223, 0.6964, 1.7272, 2.1328, 0.268, 0.295, 0.241, 0.352, 0.320, 1.12

```

10. Close the file with Hyperterminal.
11. Submit the data to the SIMBIOS project at seabass.gsfc.nasa.gov. Do so by emailing to sunphoto@simbios.gsfc.nasa.gov, or by using Fcheck on the SEABASS web site (<http://seabass.gsfc.nasa.gov>). For the sake of data redundancy, compile the data on a CD or floppies and ship with the instrument

For more information, please refer to: "User's Guide: Microtops II Ozone Monitor & Sunphotometer."

References

SIMBIOS Project: simbios.gsfc.nasa.gov/sunphotometers
 SeaBASS Database: seabass.gsfc.nasa.gov
 Solar Light Company: www.solar.com

Frouin, R., B. Holben, M. Miller, C. Pietras, J. Porter, and K. Voss, 2001: "Sun and sky radiance measurements and data analysis protocols," In Fargion, G., R. Barnes, and C. McClain, In Situ Aerosol Optical Thickness Collected by the SIMBIOS Program (1997-2000): Protocols, and Data QC and Analysis. NASA Tech. Memo. 2001-209982, NASA Goddard Space Flight Center, Greenbelt, Maryland, 26-42.

Knobelspiesse, K., C. Pietras, and G. Fargion, 2003: "Microtops II Handheld Sun Photometer Sun Pointing Error Correction for Sea Deployment," J. Atmos. Ocean. Tech. 20, 767-771.

Pietras, C., M. Miller, R. Frouin, T. Eck, B. Holben, and J. Marketon, 2001: "Calibration of sun photometers and sky radiance sensors," In Fargion, G., R. Barnes, and C. McClain, In Situ Aerosol Optical Thickness Collected by the SIMBIOS Program (1997-2000): Protocols, and Data QC and Analysis. NASA Tech. Memo. 2001-209982, NASA Goddard Space Flight Center, Greenbelt, Maryland, 11-21.

Porter, J.N., M. Miller, C. Pietras, and G. Motell, 2001: Ship-based sun photometer measurements using Microtops sun photometers, J. Atmos. Ocean. Tech., 18, 765-774.

SIMBAD Handheld Above Water Radiometer and Sun Photometer

Contents

The SIMBAD radiometer should be shipped with the following items:

1. The SIMBAD radiometer.
2. The SIMBAD power supply.
3. Serial cable to ten pin (round) SIMBAD connector.
4. SIMBIOS Measurement protocols (this document).
5. External GPS unit.
6. Optical cleaning equipment.

Setup

1. Charge the batteries of SIMBAD radiometer every night before doing any measurements. Use the AC adapter (110V or 220V) to charge the batteries.
2. Clean optics with non-abrasive paper or wipes and special cleaning solution. Do not put cleaning solution directly on the optics.
3. Turn on the SIMBAD as soon as possible and acquire a GPS record. It might take some time depending on your location (or how far the GPS is from its last measurement). The next GPS acquisition will be faster.

Operation

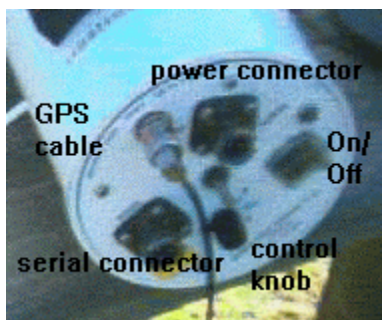
1. On the day of measurements, be sure to let the SIMBAD warm up for 1-2 hours prior to measurement. Recent studies at NIST have shown a 0.5 % instability (in sea mode) during the first hour of SIMBAD operation. Between measurements, keep the instrument on and charging in the laboratory.
2. Find a location on the ship to use for measurements – usually the bow. For sea measurements, you'll need to avoid the ship's shadow while pointing at the water at an angle of 135° from the solar azimuth angle.
3. Secure the GPS by sticking it on the ship structure using the magnetic side. Choose a place that is not obstructed by any building. Connect the GPS, and set the SIMBAD to 'PC'. It is recommended to connect the GPS a long time in advance of the first measurement, otherwise it may take up to thirty minutes to acquire the first set of coordinates. Once this has been done, subsequent GPS measurements will take less time.

Figure 11: SIMBAD control lights



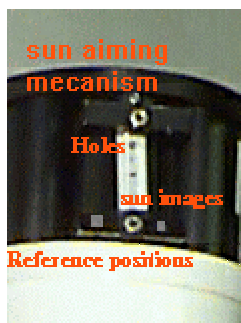
4. Lights on the instrument will blink as the GPS identifies its location. Once this has happened, the lights will stop blinking and the instrument will beep.
5. If this does not happen, change the location of the GPS and try again.

Figure 12: SIMBAD back panel



6. First, make a dark measurement. Switch the control knob to “dark”. Place the lid at the end of collimator and place the radiometer in a black bag or inside a box. Press the red button to do one dark measurement. The two red lights will blink (for about 20 seconds) during measurement, and the instrument will beep when finished.

Figure 13: SIMBAD sun aiming target



7. Now the instrument is ready to measure the sun. Switch the control knob from “dark” to “sun”. Remove the lid and aim at the sun using the sun aiming mechanism. Get the image of the sun through the holes and align them on the reference positions. Press the red button to start the measurements. Measurements take 10 seconds each. The

instrument will beep when completed. Repeat three times. Slight movements are acceptable since only the highest (and thus, most accurately pointed) signal is recorded.

8. Repeat one dark measurement. Switch the control knob from “sun” to “dark” and perform one more dark measurements. (See step 6).
9. Now the instrument is ready for sea measurements. Switch the control button from “dark” to “sea”. Remove the lid, put the strap around your neck, go to the side of the ship. Aim at the ocean above the edge of the ship after having positioned the instrument at 135 degrees in azimuth from the vertical plane of the sun. It may be difficult to find that location on a moving ship, but please avoid making measurements in the ship’s shadow! Now tilt the instrument down to the water. Instrument ‘roll’ must be kept level so that polarizing filters operate properly. The two yellow lights will be on when the nadir viewing angle is 45 degrees. Press the red button to start the measurements. It takes 10 seconds and a beep is heard to indicate the end of the operation. Repeat three times.
10. Switch the control knob from “sea” to “dark” and perform one more dark measurement. (See step 6).
11. On a research cruise, please be sure to make measurements at each station and within a half hour of each ocean color satellite overpass. If time permits, make measurements at other times (ie when the ship is moving) every hour or so. When the sun is low on the horizon, try to make more frequent measurements. If making measurements while the ship is moving, please use caution to avoid wetting the instrument.

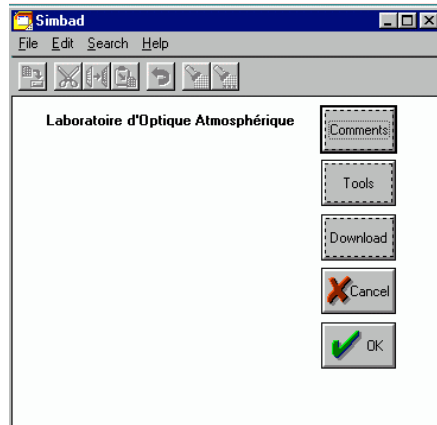
Recommendations

1. Please wait for the GPS signal to be found, even if it's sometimes a little bit long. It is especially long to find the GPS signal when the SIMBAD was off for a long time or during shipping. You may sometimes have to wait up to an hour - the best solution is to plug in the device using the main power supply and to try to find GPS as soon as you receive the device.
2. During sea measurements, do not hesitate to scan the tilt wildly between 30° and 60°, instead of trying to stabilize around 45°-50°.
3. Please be certain to:
 - a. Aim at the sun when recording SUN files.
 - b. Aim at the sea when recording SEA files.
 - c. Cover the optics when recording DARK files.
4. Take written notes.

Downloading Data

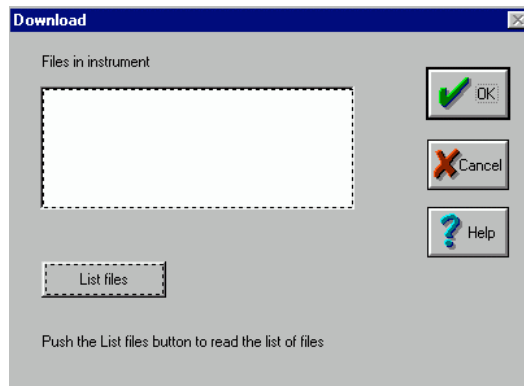
1. Connect the AC adapter to the SIMBAD before downloading measurements to avoid running low on batteries.
2. Using the serial cable provided with the SIMBAD, connect the instrument to the PC.
3. Use the SIMBAD software (on Windows 3.1, 95 or 98) to download the data.

Figure 14: SIMBAD downloading software



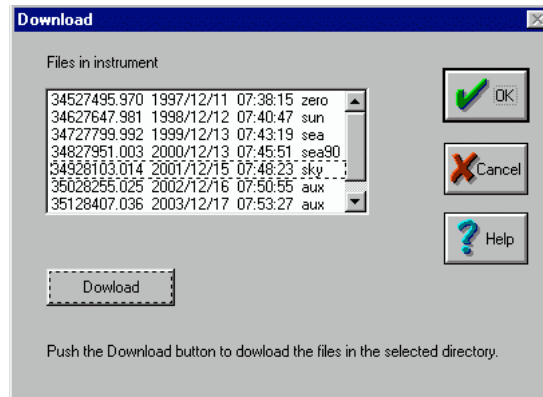
5. Turn the SIMBAD on, turn the control knob to the "PC" position and press the red button to stop the automatic GPS initialization. Run the SIMBAD program.
6. If the instrument is not connected or if the window does not appear, check the COM port using "Tools" to look in the simbad.ini file. Otherwise, push "Download".

Figure 15: SIMBAD software file list



7. Push "list files" to get a list of files stored in the memory.

Figure 16: SIMBAD software file download



8. Push "Download" to get the files from the instrument.
9. Delete the data from the internal memory before turning the SIMBAD off.
10. Submit the data to the SIMBIOS project at seabass.gsfc.nasa.gov. Do so by emailing to sunphoto@simbios.gsfc.nasa.gov, or by using Fcheck on the SEABASS web site (<http://seabass.gsfc.nasa.gov>). For the sake of data redundancy, compile the data on a CD or floppies and ship with the instrument
11. NOTE: On rare occasions, the SIMBAD can descend into a mode where it does not turn on or otherwise respond to user controls. Should this happen, connect to the software as shown above, and delete all the files (after saving them to disk) to reset the memory. Also, please let the SIMBIOS Project know if this does occur.

References

SIMBIOS Project: simbios.gsfc.nasa.gov/sunphotometers

SeaBASS Database: seabass.gsfc.nasa.gov

LOA SIMBAD page: www-loa.univ-lille1.fr/simbada/simbada/public_html/index1.html

Scripps SIMBAD page: polaris.ucsd.edu/~simbad

Frouin, R., B. Holben, M. Miller, C. Pietras, J. Porter, and K. Voss, 2001: "Sun and sky radiance measurements and data analysis protocols," In Fargion, G., R. Barnes, and C. McClain, In Situ Aerosol Optical Thickness Collected by the SIMBIOS Program (1997-2000): Protocols, and Data QC and Analysis. NASA Tech. Memo. 2001-209982, NASA Goddard Space Flight Center, Greenbelt, Maryland, 26-42.

Pietras, C., M. Miller, R. Frouin, T. Eck, B. Holben, and J. Marketon, 2001: "Calibration of sun photometers and sky radiance sensors," In Fargion, G., R. Barnes, and C. McClain, In Situ Aerosol Optical Thickness Collected by the SIMBIOS Program (1997-2000): Protocols, and Data QC and Analysis. NASA Tech. Memo. 2001-209982, NASA Goddard Space Flight Center, Greenbelt, Maryland, 11-21.

SIMBADA Above Water Radiometer And Sun Photometer

Contents

The SIMBADA radiometer should be shipped with the following items:

1. The SIMBADA radiometer.
2. The SIMBADA power supply.
3. Serial cable to ten pin (round) SIMBAD connector.
4. SIMBIOS Measurement protocols (this document).
5. Optical cleaning equipment.

Setup

1. Charge the batteries of SIMBAD radiometer every night before doing any measurements. Use the AC adapter (110V or 220V) to charge the batteries.
2. Clean optics with non-abrasive paper or wipes and special cleaning solution. Do not put cleaning solution directly on the optics.
3. Turn on the SIMBAD as soon as possible and acquire a GPS record. It might take some time depending on your location (or how far the GPS is from its last measurement). The next GPS acquisition will be faster.

Operation

1. On the day of measurements, be sure to let the SIMBADA warm up for 1-2 hours prior to measurement. To turn on the device, use the switch located on the side panel and push the red button on the left side of the front panel. Recent studies at NIST have shown a 0.5 % instability during the first hour of SIMBADA operation. Between measurements, keep the instrument on and charging in the laboratory.
2. Find a location on the ship to use for measurements – usually the bow. Choose a place that is not obstructed by any building. For sea measurements, you'll need to avoid the ship's shadow while pointing at the water at an angle of 135° from the solar azimuth angle.
3. The message "No GPS" is displayed on the bottom right when the GPS antenna is initializing. The number of detected satellites is indicated in the top right of the display. When more than 3 satellites signals are found, the GPS antenna is initialized and the message "GPS. Ok" is displayed.
4. Press the red left button to select one of three scenarios/modes, namely DARK (measurement of dark current), SUN (sun viewing), or SEA (ocean viewing). The experimental procedure is to make, consecutively, one DARK measurement, three SUN measurements, three SEA measurements, three SUN measurements, and one DARK measurement.

5. DARK mode: Press the red left button until display "BLACK" is displayed. Close the lid, and cover the region with some cardboard and/or dark cloth, so that no light can enter the instrument. Press the right green button to acquire the measurements. The display shows a decreasing counter in the top right. The measurement lasts 10 seconds. A beep indicates the end of the measurement.
6. SUN mode: Press the red left button once. ("SUN" is displayed). Aim at the sun (the sun image must be seen through the sun target) and press the right green button to acquire the measurements. The measurement lasts 10 seconds. A beep indicates the end of the measurement. The sun azimuth angle is stored in memory.
7. SEA mode: Press the red left button once more. ("SEA" is displayed). Go to the side of the ship, and find the heading 135° from the sun heading (this is the azimuth angle). Since you have two choices, pick the one that best avoids ship shadow and wake. If held horizontally, the SIMBADA displays the azimuth angle in its LCD. Now point the instrument 45° down at the water. Press the green button to start recording measurements this should last about 10 seconds. A beep indicates the end of the measurement. To avoid viewing the ship trail or foamy sea, it is better to scan continuously the sea between 30° and 60°. Be sure that the 'roll' tilt IS NOT greater than about 20°, so that the polarizer remains in a suitable position.
8. On a research cruise, please be sure to make measurements at each station and within a half hour of each ocean color satellite overpass. If time permits, make measurements at other times (ie when the ship is moving) every hour or so. When the sun is low on the horizon, try to make more frequent measurements. If making measurements while the ship is moving, please use caution to avoid wetting the instrument.
9. The following meteorological data should be acquired concurrently, whenever possible: date, time, Lat., Lon., cloud cover and type, air temperature, dew point (or wet bulb), temperature, surface pressure, visibility, wind speed, wind direction, whitecaps (none, low, moderate, or high), water temperature, surface chlorophyll, etc.... Some of these data may be available from the bridge log.

Recommendations

1. Please wait for the GPS signal to be found, even if it's sometimes a little bit long. It is especially long to find the GPS signal when the SIMBAD was off for a long time or during shipping. You may sometimes have to wait up to an hour - the best solution is to plug in the device using the main power supply and to try to find GPS as soon as you receive the device.
2. During sea measurements, do not hesitate to scan the tilt wildly between 30° and 60°, instead of trying to stabilize around 45°-50°.
3. Please be certain to:
 - a. Aim at the sun when recording SUN files.
 - b. Aim at the sea when recording SEA files.
 - c. Cover the optics when recording DARK files.
4. Take written notes.
5. When recording a set of records, start with a SUN record (after a dark file of course), and note on the LCD display the cap. Then, when recording a SEA file, try to have a

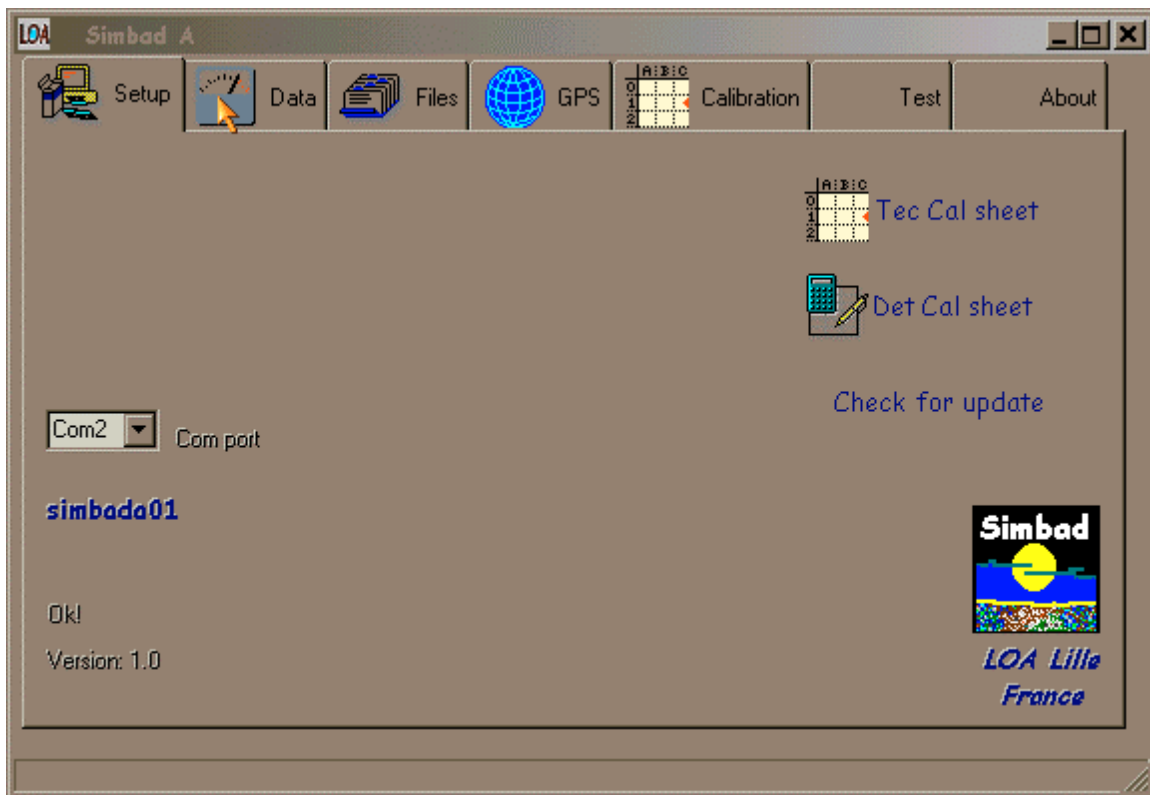
relative azimuth angle of 135° between SUN and SEA records (the cap on the is displayed in degrees).

If you notice problems with bad data, or erroneous screen display, the SIMBADA can be reset if you do an entire data erase from the downloading software.

Downloading Data

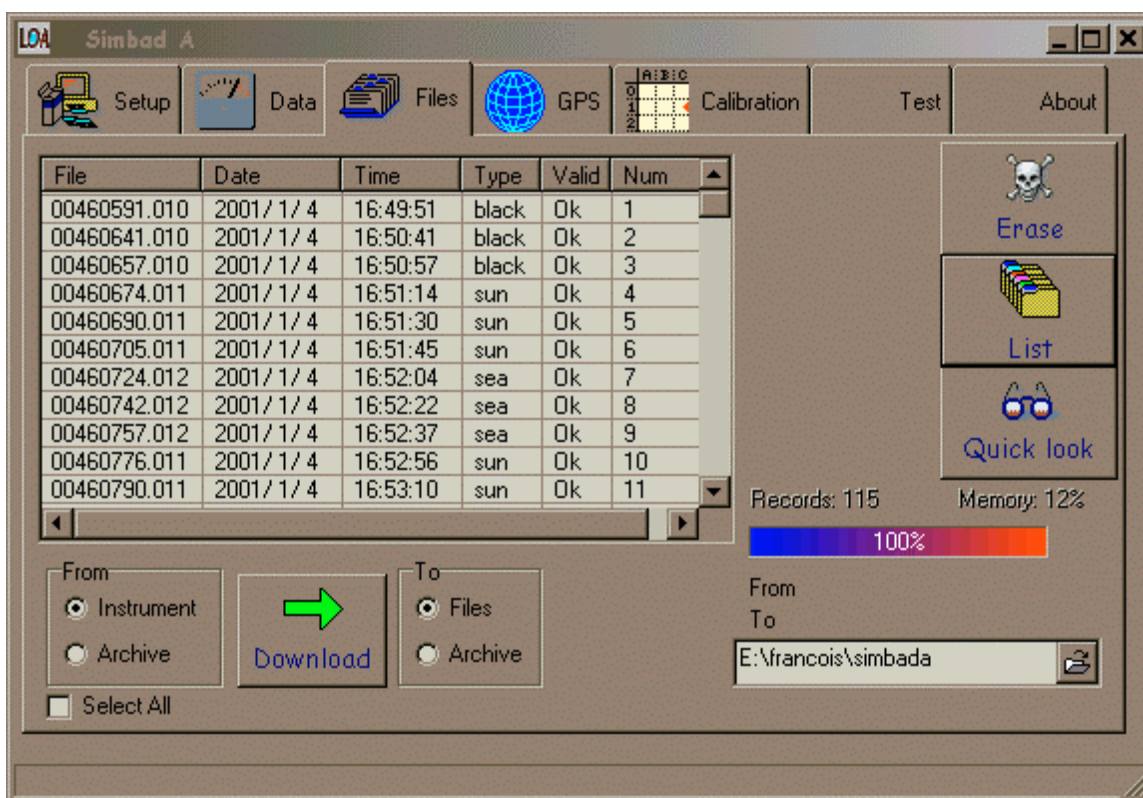
1. Connect the data cable to the instrument, and turn it on.
2. Run the SIMBADA executable program, and follow instructions on the menu as explained below. If you install the software for the first time, you need to decompress the archive file Simprog.zip (winzip format), and install it in a dedicated folder, for example "C:\simbada\".

Figure 17: SIMBADA software



3. Choose the serial port Com1 or Com2 on which the SIMBADA device is connected. If the device is present and connected to the PC, the message "simbada[##]" is displayed in the bottom left corner. Otherwise, "No connection" or "Please wait!!!" are displayed. In that latter case, either the instrument is not switched on, or the device is not connected on the specified serial port.

Figure 18: SIMBADA software file list



4. The menu tab "Files" allows you to manage the content of the data memory. By clicking on the "List" button on the right hand side, you can list the files stored in the memory and the percentage of memory used. Each file corresponds to one line on the grid. Each file contains several pieces of information: Name of the file, date of record, time of record, type of file (Dark, Sun, Sea, etc), validity flag, and recording number.
5. File content can be edited using the "Quick look" button. Either one file or several can be selected using the mouse and Shift key. The 'Select All' button in the lower left corner does just that.
6. Data can be saved on disk or in the folder specified in the box on the lower right corner, either in a "file by file" format by choosing "From: Instrument; To: Files " or in an archive file. This archive could be read again by choosing "From: Archive; To: Files", and then the files could be save on disk the same way as above.
7. Memory can be cleared by clicking on the "Erase" button. A dialog box will then appear to confirm or not your intention. You can then verify that the memory is empty by clicking again on the "Files" button. This also resets the instrument if it has stopped responding otherwise. Delete the data from the internal memory before turning the SIMBADA off.
8. Submit the data to the SIMBIOS project at seabass.gsfc.nasa.gov. Do so by emailing to sunphoto@simbios.gsfc.nasa.gov, or by using Fcheck on the SEABASS web site (<http://seabass.gsfc.nasa.gov>). For the sake of data redundancy, compile the data on a CD or floppies and ship with the instrument

NOTE: On rare occasions, the SIMBADA can descend into a mode where it does not turn on or otherwise respond to user controls. Should this happen, connect to the software as shown above, and delete all the files (after saving them to disk) to reset the memory. Also, please let the SIMBIOS Project know if this does occur.

References

SIMBIOS Project: simbios.gsfc.nasa.gov/sunphotometers

SeaBASS Database: seabass.gsfc.nasa.gov

LOA SIMBADA page: www-loa.univ-lille1.fr/recherche/ocean_color/src/

Frouin, R., B. Holben, M. Miller, C. Pietras, J. Porter, and K. Voss, 2001: "Sun and sky radiance measurements and data analysis protocols," In Fargion, G., R. Barnes, and C. McClain, In Situ Aerosol Optical Thickness Collected by the SIMBIOS Program (1997-2000): Protocols, and Data QC and Analysis. NASA Tech. Memo. 2001-209982, NASA Goddard Space Flight Center, Greenbelt, Maryland, 26-42.

Pietras, C., M. Miller, R. Frouin, T. Eck, B. Holben, and J. Marketon, 2001: "Calibration of sun photometers and sky radiance sensors," In Fargion, G., R. Barnes, and C. McClain, In Situ Aerosol Optical Thickness Collected by the SIMBIOS Program (1997-2000): Protocols, and Data QC and Analysis. NASA Tech. Memo. 2001-209982, NASA Goddard Space Flight Center, Greenbelt, Maryland, 11-21.